THE

AGRICULTURAL MUSEUM.

OMNIS FERET OMNIA TELLUS VIRG.

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AN ENQUIRY CONCERNING THE SMUT IN WHEAT.

1. *Of its Cause.* 2. *Of the Means of preventing it.* 3. *Of its Remedy.*

MANY are the *nostrums* which are said to be infallable in preventing or remedying this common evil; and many more are the pretenders to choice secrets, which are effectual, certainly, to the same most valuable purpose. But every practical farmer of common observation knows, assuredly, to his sorrow, that in favourable seasons none of the boasted means he has used hath ever effectually answered his purpose.

The first step towards the remedying any evil either in the animal or vegetable kingdom, is the true knowledge of its cause; without it, all is quackery, and too often the artifice of designing adventurers, who hope to make a sinister advantage of the weak and credulous, who are apt to swallow the hook which is covered with a gilded bait. Every one embraces with pleasure what he is persuaded will promote his interest.

The previous question is, what is the *cause* which generally produces the smut in wheat?

To this no positive or probable answer has been given. It has been generally supposed, if one may judge by the means commonly used to prevent it, that it proceeds from the seed, whose *stamina*, by some means or other, have been vitiated; for all the means of prevention I ever heard of, were used in the preparation of the seed previous to its being sowed.

The most common method is brining and liming the day before sowing; which is done either with sea water, the brine of meat, or if sea-salt dissolved in water made strong enough to bear an egg. To this, some whimsical people have capriciously added several ingredients, which are much more likely to destroy the vegetative principle of the seed, than to remedy any evil the rudiments of which might latently subsist in it. To this purpose, flour of brimstone, aloes, copperas, and verdigrease in fine powder, assafœtida, and even arsenic, have been recommended to be infused in the pickle; but this is so very absurd, and even dangerous, that men of sober common sense are both afraid and ashamed of the practice.

The practice of brining and steeping was suggested by accident, established by custom, and continued against all reasonable conviction of its utility In unfavourable seasons, every one knows, that smut generally prevails in spite of every precaution that has been hitherto taken. Brine, pickling, liming, change of seed, and seed of one year old and upwards, avail nothing. In cold wet summers the smut prevails, notwithstanding the use of every means which invention hath urged, or ingenuity practised.

The circumstances that first attracted my notice, and engaged my attention to this subject, were as follow:— Some years since I set a ridge with wheat, by way of experiment, in rows at various distances; in the course of the spring it was hoed two or three times, and was as healthy, vigorous and fine, as ever was seen. In general it was from four to five feet and a half high, the straw uncommonly large and strong, and the ears from four to five inches and a half in length. No corn ever appeared more promising. Thus it continued till the bloom appeared, about the middle of June. The weather then became wet and cold, and frequently deprived the corn of what is usually called its blossoms. Before the end of the month, the ears put on a sickly look, and upon examination, it was found amazingly smutty; more so

indeed, than I had ever observed any before. In vain I examined the roots, the straw, the joints, &c. all appeared sound and perfect, till I came to the ear; there the evil began, but from what cause, or by what means, not the least vestige could be found.

As the plants were vigorous, perfectly healthy, and sound, till the bloom appeared, and then turned sickly and distempered, and at length immoderately smutty, it seemed very clearly to follow, that it could not be owing to any imperfection in the seed, but entirely to the inclemency of the air, which by some means or other infected the grain in its embryo state, and converted the milky substance, which constitutes the meal or flour of the corn, into a black fœtid, unwholesome powder, known by the name of smut.

Strongly impressed with this opinion, I determined to embrace every opportunity of gaining all possible information on the subject. For some two or three years the seasons were favourable, and afforded no opportunity for observation; but 1787 was an unprosperous year, and gave us smutty wheat in abundance. Yet though I was very attentive to its progress after it was discovered, I gained no additional intelligence respecting the cause; but a full confirmation of my former opinion, that the smut was generally, if not totally, caused by the inclement and vitiating principles of the atmosphere which happened at the time of its blossoming; for till then it was free from every appearance of defect whatever. This, however, did not relax my resolution of endeavouring, by every means in my power, to investigate the true cause; whether it originated from any defect or imperfection in the seed, or was principally owing to a destroying distemperature or blighting principle of the air.

The next year, 1788, was very favourable to the growth and ripening of wheat. The summer was dry and healthy, and the corn sound and good, though the straw was very short and scanty. The seed I sowed was of my own saving, of the same year's growth, and

sowed on the same land, without any change whatever, yet I had no smutty wheat that year, and therefore no opportunity of making remarks. The next seed time I had a mind to try the white cone wheat, and therefore procured my seed from a different county, and took all the usual precautions to guard against the smut. The seed was perfectly sound and good, yet I had not a ground that was perfectly free from it this year.

Most of my wheat this year was sown in drills at various distances, for the sake of experiments, and was all horse and hand hoed. In the months of April and May it was amazingly fine, so as to be the admiration of all that saw it. The farmers in the neighbourhood declared they had never seen any thing equal to it before, for height, size, vigour, strength of stalk, and length of ear. In this flourishing state it continued till above the middle of June. About this time the weather grew cold and stormy, and continued so till towards the end of July, a few fine days intervening. The wheat was now in full bloom, but frequently stripped of it by the hasty showers that fell. Such, however, is the wonderful economy of nature, that if wheat be stripped of its bloom by the intemperance of the weather, a fine warm day reinstates it, and the bloom becomes as fair and promising as ever. This I have observed it to do several times in alternate succesion; but there is a limit which the return of the blossoms cannot survive, and if it happen before the embryo is duly impregnated, then the kerning or granulating succeeds badly, and at harvest the corn proves defective and smutty.

During the growth of the corn this year (1789) I was very attentive to it from the first appearance of the ear in the side of the stalk to the time of its maturity. Soon after the showery time above mentioned, I observed a great number of the ears turned quite brown, as if they were ripe; but upon examination they proved to be abortive ears, without any corn in them; they handled as loose and soft as corn that had been threshed. This circumstance surprized me very much. To see corn,

which so short a time before was so very fine and flourishing, prove to be nothing more than chaff, was exceedingly mortifying indeed! I imagined the roots had been destroyed by some insect or reptile; but, upon examination, I found them as sound and perfect (as indeed was the whole plant, the ear excepted) as corn could possibly be.

Soon after this, I observed the south side of one of the finest fields grow smutty. It was sufficiently discouraging to see corn five feet high, with ears five or six inches long, and as healthy and vigorous as ever was seen, in a few days converted into smut. This unwelcome circumstance furnished opportunities, more than enough, to exercise the most inquisitive mind in search of the causes of those evils, which blast at once the hopes and expectations of the most sagacious and industrious husbandman. To investigate the cause, I began by examining the roots of the smutty ears, then the stems or straw, the joints, and every part up to the ear, in any of which no defect whatever was to be found. I had not proceeded far, however, before I observed, that both smutty and sound ears were frequently produced and nourished by the same root, and consequently were both produced from one and the same individual seed. This circumstance alone goes very far towards proving, that the cause of the smut does not exist originally in the seed; for if its *stamina* were vitiated or corrupted, it is not possible to conceive that it should produce plants sound, healthy, and vigorous, for eight or nine months, and then some ears full of corn perfectly sound and good, and others nothing but smut balls.

Not fully satisfied with this, I pursued my intention, and spent much time in examining the smutty ears; I soon discovered it was no very uncommon thing for the same ear to contain both sound and smutty corn.

In some ears the tops were mostly smutty, and the bottoms sound; in others the tops were sound and the bottoms smutty; but more generally, one side of the ear was all smut, and the other mostly sound. One of the

last ears I examined contained forty smut balls, twenty-one corns that were perfectly sound and good, and five corns that had one end smutty and the other sound.

From this state of facts it is hardly possible to resist the conviction that the smut is caused by the inclemency of the atmosphere, and that constantly and invariably in the season of its blowing.

To sum up the whole of this matter then, it seems as certain, as demonstration can render it, that the smut is not owing to any defect or imperfection in the seed, but entirely to some corrupt vitiating principle of the atmosphere in the blowing season, which blights and destroys the grain in some shape or another, according to the time it has been blowing when it has been struck with the blight. Those ears which are totally deprived of their blowings at the beginning of the season, before the corn in its embrio state is duly impregnated with the *farina fecundans*, or male dust, become abortive, and are absolutely without any corn at all. Those that are further advanced, and have the embrio formed ready for impregnation, if in that state they are deprived of the fecundating principle, either wholly or in part, the milky matter, which constitutes the substance of the grain, for want of the vivifying principle, is wholly, or in a certain proportional part, converted into a ball of black stinking powder or smut. Sometimes, even after the corn is well formed and filled with the milky juice, sufficiently impregnated with the male principle, it is struck with the blight, which, though it come too late to prevent the perfection of the vivifying principle, and thereby render it unfit for seed, yet it is little more than two rinds, it being in a manner starved, the mealy substance of which the flour consits being almost entirely wanting.

From all this it very clearly appears, that all the boasted steeps prepared for preventing the smut are chimerical, and void of all reasonable foundation whatever. In warm dry healthy summers the smut is seldom if ever found, though the land be sown with seed that is smutty, and without any preparation at all. I would however

recommend washing the seed in fair water a day or two before sowing. By this means the light imperfect corns, chaff, and seeds of weeds, if any, are separated from the seed corn, swim at top, are easily skimmed off, and the remainder much more clean and perfect.

The writer has now several experiments, in prosecution, by which the above observations may probably be satisfactorily confirmed, which he hopes to have the honour of communicating in due time. He does not presume to claim the promised premium, being sensible he has not performed the *literal* conditions, which he apprehends no power is by any means equal to, but THAT only which "rides in the whirlwind and directs the storm." The power which is competent to the prevention of the smut in wheat, is equally so to the preservation of the bloom of the fruits of the orchard, the hop garden, from the maggot in peas, the black dolphin in beans, the fly in turnips, and the caterpillar in all the cabbage tribes, whose devastation at this very time has laid the whole country waste. Instead of cabbages nothing is to be seen but the bare ribs of the leaves, like mere skeletons, the hearts, &c. being entirely destroyed.

However great the evil be which attends a crop of very smutty wheat, the sound grain may be made clean, sweet, and wholesome, with little trouble, and a moderate expence, as appears by the following account:

In the year 1787 I had a great deal of very smutty wheat, which would sell for little more than one half, or at most two-thirds of the price of good wheat, which put me upon making the following experiment:—I took about a gallon of the wheat, and put it into a pail of fair water, and stirred it about well for a minute or two with a stubbed broom. It made the water almost as black as ink. This water was then poured off, and a second added, in which it was again well stirred, and then poured off as before. This cleared it entirely from the smut and all discolouring matter. Then, when it was well drained, it was put into a broad shallow pan & set before the fire, when in a short time it became dry

enough to grind; for staying so short a time in the water it imbibes very little of it, and what adheres merely to the superficies is soon exhaled by a moderate heat. When dry it was no way distinguishable from the cleanest and soundest wheat, but by the superior brightness of the colour. It had a fairer and more delicate complexion than unwashed wheat, by which it was to be distinguished only, even by those who had long dealt in the article and were in the secret. Encouraged by the success of this experiment, I had a load of it washed, sent it to a malt-house in the neighbourhood, and had it kiln-dried by a very moderate fire. I sent a sample of it to market by a neighbouring farmer, of long experience, without taking any notice to him of what had been done. He said it was a very bright pretty sample, but did not discover it had been smutty or washed, till he had shewn it to a miller of great business, who presently knew what must have caused its brightness; at the same time he owned it was not a penny the worse, as it was now clean and sweet, and perfectly dry. The waste in washing and drying was about two bushels; ten shillings I paid the maltster for drying, &c. which made the expence about a guinea, whereby at least three or four were saved. From this account it appears, that a smutty crop it not an evil of such intolerable magnitude as hath been generally thought.

In the conditions of the premium, it seems, are involved, what is impracticable and impossible. In the above account the writer flatters himself, that he has thrown as much light upon the subject, as is discoverable by human means, and begs leave to submit it to the candid consideration of the honourable Society, whether such an investigation merits their approbation and *encouragement* or not.

Premiums offered for preventing evils which originate from intemperate seasons and destroying blights, may excite invention, artifice, cunning, imposture and deception, but can never extend the boundary, or ex-

and the circle of human knowledge, or human power. He and He only, who can repel the malignant blasts of the East, fraught with myriads of consuming insects, which originate from what and where none but Omniscience knows, and substitute the soft, healing balmy zephyrs of the West, can reward the labours of the industrious husbandman with plenty and happiness!

To the Conductor of the Farmer's Museum.

CONSIDERATION ON THE SELECTION OF WHEAT FOR SEED.

Sir,

From a long practice in the trade of a baker, I had opportunity of observing the very different effects of fermentation on the flour of the numerous parcels of wheat which I manufactured; and I always found, that in proportion as the wheat was bad, the more easily was it fermented—that in the case of smutted wheat, it was necessary that the fermenting spunge should be set very cool, otherwise sour bread would be the consequence; and that the flour of first rate wheat required the spunge to be set considerably warmer; or, which amounts to the same thing, that a greater quantity of yeast would be added to it. The inference I drew from these observations was, that the degree of fermentation proper to be excited, depended entirely upon the quality of the wheat; or in other words, upon the quantity of *gluten* which it contained. And in order to ascertain this as correctly as possible, I had recourse to the following experiment, which I found to answer the purpose, and which I ever afterwards continued to practise with every parcel of grain that I manufactured. I took a pound weight of fine flower, made it into dough, tied it loosely into a linen cloth, and washed and rubbed it in two or three basins of water, or in a running stream, till the whole mechanism parts were disolved, and nothing but the *gluten* remained, which, when dried, weigh-

ed from less than two, to three, four, and sometimes five ounces. Having thus ascertained the quality of the wheat by the quantity of *gluten* it contained, I sowed part of a field with grain, which, from former experiments, I knew contained a large proportion of *gluten*; and the remainder with wheat purchased from London in the preceding year. Though this grain did not appear to me to contain nearly so much *gluten* as the other, yet it had not the least appearance of smut. The event, however, turned out as I expected; the produce of the seed merchant's wheat being much affected, by smut, whilst not a single boll was to be found among the rest. From this, I am inclined to infer, that though particular seasons may have a tendency to the production of smut, if attention is paid in selecting for seed, that wheat, the fine flower whereof is found to contain four or five ounces of *gluten* (if more the better) to the pound, that smut would seldom occur,

I am, Sir yours, &c.

AN OLD BAKER.

AMERICAN MANUFACTURES.

Dr. MITCHILL has compiled from the returns made to the Treasury Department by the marshals, deputy marshals and other persons, pursuant to the third census law, the following interesting view of certain valuable manufactures in the United States.

"Some most valuable information is derived from these returns, incomplete as they are. Under the head of sheep, we learn that Vermont contains a stock of 450,000 sheep; Massachusetts, 399,182; Connecticut, 400,000; and Pensylvania, 1,466,918 Those papers contain a more distinct and interesting exhibition than we ever had before of the saltpetre manufactured in the U. States Thus Virginia prepares 59,175 pounds; Kentucky, 201,937; Massachusetts, 23,600; Tennesee, 162,4 6—making nearly half a million pounds of home made nitre, as good as that usually brought

from foreign ports. It is alledged, the quantity may be increased to any desirable amount. The connection of this with numerous manufacturies of gun powder, puts us quite at our ease as to the nitrate of potash, and to the means we posess of compounding it.

The manufacture of straw is eminently worthy of notice. In Massachusetts, where the forming of bonnets from that material seems to have first begun, the yearly amount of the sale is not less than 551,98 dollars. The manufacture of straw bonnets has been since undertaken in Connecticut, and produces the yearly value of 27,100 dls; and it is worthy of remark that the labours of two women in New Jersey in the same way, yielded them 140 dls. amounting to the sum of 579,228 dls. for the single article of straw bonnets.

"Nor is the preparation of sugar from the juice of the maple tree unimportant. Of this domestic sweet, Ohio produces in a twelve month, 3,033,866lbs; Kentucky, 2,471,647; Vermont, 1,200,000, and East Tennesee, 162,340; making a quantity of nearly seven millions of pounds in these States only, wherein the returns may be conceived to be greatly within the truth.

"Works in horn, ivory, and shell have made a progress that is worthy of notice. The combs, for instance, which Connecticut prepares annually for market, are estimated at 70,000 dollars; Massachusetts, 80,624; and Pennsylvania 6240: equalling a sum of 156,861 dollars.

"I may mention too the abundance of copperas which West Tennessee and Vermont afford. The quantity per annum from the former, is stated at 56,000 pounds; and from the latter at 8,000. The quality of these sulphates of iron is declared to be very fine, and that druggists and dyers may be supplied to any demand they may make.

"The quantity of ardent spirits annually distilled appears, by the returns, to equal the prodigious amount of 23,720,000 gallons! The extraction of brandy from peaches, of an alcoholic liquid from cider, and of

whiskey from rye, and even maize, is carried to this alarming excess. The products of the distilleries are chiefly consumed among ourselves, though a portion of the latter is converted to gin before it reaches the human stomach. While therefore, we observe the increase of these home-made fluids, we must reflect on their inebriating effects. It cannot be disguised that their intoxicating quality recommends them to such general employment. Nor ought it to be concealed, that in a country where a gallon of this maddening stimulus can be bought for half a dollar, a gill may be obtained at retail for three cents, and the seller at the same time double his money. The fondness for this bewitching beverage and the repugnance to an excise upon it, raise in the mind a curious association between the free use of it and of political freedom—and it deserves the consideration of all the thinking part of society how far disease, idleness, immorality and other mischiefs incidental to strong passions may not degrade freedom to rudeness and something worse.

"The number of water and horse mills employed in spinning cotton on this exhibition, amounted to 330, in the month of August, 1810, and working 100,000 spindles. These, on an average, will spin annually between 4 and 500,000 pounds of yarn; and that yarn would be sufficient to weave 18,000 yards of cotton cloth, three quarters of a yard wide; and this is wholly independent of what may be spun in private families although it makes part of what is wove there.

"The fulling mills returned amount to 1630; and the wool carding machines going by water to 1835.

"The number of looms returned exceeds 330,000, and the total number of yards of cloth made of wool, cotton and flax, as returned, exceeds 75,000,000.

"Gunpowder mills are enumerated to the number of 207, and though some of them are small they prepare yearly 1,450,000 pounds of gunpowder—530 furnaces, forges, and bloomeries are enumerated.

"The paper mills amount to 190."

COLUMBIAN AGRICULTURAL SOCIETY.

The fifth semi-annual exhibition of the Columbian Agricultural Society was held in that elegant lot of woodland belonging to Thomas Beall, esq. of Geo. of this place.

The Hon. Joseph Kent, the Hon. John Taliaferro, of the House of Representatives and Hon. Tho's Worthington, of the Senate of the United States, and Clement Brooke and John Threlkeld, esqrs. were appointed judges of sheep.

John Davidson, John Cox, Thomas C. Wright, Wm. G. Ridgely, and William Stewart, esqrs. judges of manufactures.

Isaac Pierce, Emmor Bailey, John Neeld, David Frame, and Joseph Canbey, esqrs. judges of Ploughs.

And Premiums to be paid in plate, were by them awarded as follows—

Premium 1. SIXTY DOLLARS for the best two toothed Ram Lamb of the fine wooled breed—To Gen. John Mason of Annalostan Island, District of Columbia, for his full blooded Merino Ram *Golden Fleece*, of imported Father and Mother, from the Spanish flock of the duke of Infantado.

2. FORTY DOLLARS for the 2d best two toothed Ram Lamb of the fine wooled breed, to his ex. Ed. Lloyd of Wye, Talbot county, late governor of Maryland, for his full blood merino Ram lamb Talbot, of imported father and mother, from the Spanish Paular flock of the Prince of Peace.

3. SIXTY DOLLARS for the best two toothed Ram Lamb of the long wooled breed; to George Calvert, Esq. of Prince Georges county, Maryland, for his long wooled Ram Lamb of the Persian Breed; crossed on the sheep of the country.

4. FORTY DOLLARS for the 2d best two toothed Ram Lamb of the long wooled breed; to Wm. Marbury, Esq. of Georgetown, District of Columbia, for his half blooded Merino Ram, of Col. Humphrey's stock; crossed on the North Friezeland breed.

5. THIRTY DOLLARS for the best piece of Cotton Cloth, suitable for womens' dresses, to Mrs. Martha P. Graham, of Dumfries, Virginia.

6. THIRTY DOLLARS, for the best piece of Fancy Patterns for Vests, to Mrs. Martha P. Graham, as above.

7. THIRTY DOLLARS, for the best piece of Cotton Cloth, suitable for Pantaloons or small clothes, to Mrs. Sarah M'Carty Mason of Hollin Hall, Fairfax county, Virginia.

8. TEN DOLLARS for the best pair of knit or woven Stockings of cotton or thread, to Mrs. Mary Anderson of Montgomery C. H. Maryland.

9. THIRTY DOLLARS for the best piece of Hempen or Flaxen Sheeting, to Mrs. C Kimbol of Fredericktown, Maryland.

10. THIRTY DOLLARS, for the best piece of Hempen or Flaxen Shirting, to Mrs. Margaret Knode of Washington county, Md.

11. THIRTY DOLLARS, for the best piece of Hempen or Flaxen Table Linen, to Mrs. Maria Louisa Nourse of George town, District of Columbia.

12. TWENTY DOLLARS for the best piece of Twilled Bagging, of Hemp, Flax, or Cotton, to Mrs. Neeld, of Montgomery, Md.

13. THIRTY DOLLARS for the best piece of Bed Ticking of Flax or Cotton, or in part of all or either, to Mrs. Sarah M'Cartey Mason, of Hollin Hall as above.

14. TWENTY DOLLARS, for the best three horse plough to break up heavy land, to William Thornton of Montgomery county, Md.

horse plough

15. TEN DOLLARS, for the best two horse plough to break light land, to James Brown of Montgomery county, Md.

16. TEN DOLLARS, for the best weeding plough to go with one horse—to Solomon Cassidy, of Alexandria, District of Columbia.

The exhibition of Domestic manufactures was highly gratifying, in point of number of articles, variety, beauty and quality.

There was a greater number of sheep shewn than at any former meeting of the society, especially of the fine wooled breed. It was made manifest to every one, that Merino sheep may be brought to as great perfection, in the states adjacent to the Potomack, as in any countryin the world, where an attempt has been made to raise or keep them. The full blooded Merino sheep and those of the higher crosses, exhibited for premium, and shewn as specimens of sheep yeaned and raised in this country, were decidedly preferable to those imported from Spain or any other part of Europe, in almost every essential or desirable quality, in size, in beauty, in quantity of wool, and not inferior in fineness of wool.

None of the sheep had been previously washed. The weight of the wool it may be supposed, was encreased by the dampness of the day. This may have been the case, but not to any considerable extent. Almost every sheep that was offered for premium, was brought to the ground under cover in a cart, waggon, or something of the kind, and most of them had been carefully housed from wet for several weeks before, in order to keep them clean. And great precaution was used in weighing them clean.

The following are the weights of the Sheep:

1st. Of those which obtained premium.

General John Mason's Merino ram lamb, Golden Fleece, which took the first premium for fine wool.

	lbs. oz.
Carcase	93 6
Fleece	10 6
Total	103 12

Governor Lloyd's Merino ram lamb, Talbot, which took the second premium for fine wool.

Carcase	123 6
Fleece	13 10
Total	137 00

George Calvert's ram lamb of the Persian breed, crossed on the country sheep, which took the first premium for long wool.

Carcase 108 04
Fleece 12 06

Total 120 10

William Marbury's ram lamb, half blood Merino, crossed on the North Friezland breed, which took the second premium for long wool.

Carcase 157 08
Fleece 11 14

Total 169 06

3d. Of the unsuccessful competitors of the fine wooled breed.

J. Mason's Marquiss. Carcase 110 08
Fleece 11 14

Total 122 06

Roger Brook's. Carcase 88 05
Fleece 8 06

Total 96 11

Bazil Brooke's. Carcase 82 05
Fleece 9 07

Total 91 12

Lawrence Lewis's. Carcase 95 08
Fleece 12 00

Total 107 08

Gov. Lloyd's D. Manuel. Carcase 122 00
Fleece 10 08

Total 132 08

P. B. Key's.	Carcase	123 00
	Fleece	8 12
	Total	131 12
Thomas Peter's.	Carcase	145 08
	Fleece	9 01
	Total	154 09

3d. Of the unsuccessful competitors of the long wooled breed.

Bernard Gilpin's.	Carcase	67 13
	Fleece	9 04
	Total	77 00
Roger Brooke's.	Carcase	124 00
	Fleece	9 00
	Total	133 00
Governor Lloyd's.	Carcase	145 08
	Fleece.	9 01
	Total	154 09

There were other sheep exhibited, that either were not shorn and weighed, or no certain account could be obtained of the weights; but from the weights above it is sufficiently evident that the Merino sheep exceeded the long wooled breed not only in quality of wool, but in quantity, and on an average were very little inferior in weight of carcase.

DAVID WILEY, Sec.

May 22, 1812.

ON CYDER.

By the Rev. John B. Johnson, of West Springfield

The art of making Cider is, in our country, little attended to; and, I am persuaded, little understood. It is

well known that we have many sorts of apples, some of which are remarkable for a fine delicious taste, and others for an aromatic flavor. This assuredly indicates that they are possessed of a juice, which, under the management of adequate knowledge, might be made a fine bodied wholesome and pleasant liquor. That the cider which is generally brought to our markets, is of an opposite quality, every one knows. It is neither agreeable to the palate, nor, I presume, from its early ascidity, salutary to the stomach. That it is suspectible of great improvement, generally, is obvious, from the perfection to which it has been brought by the farmers of Newark; and will farther appear from the following fact: In England a certain farmer has, of late years, made cider of such an excellent quality, that it might be said to rival the nectar of the grape; and actually sold for the enormour sum of sixty guineas or two hundred and eighty dollars a hogshead. If we are not possessed of the knowledge requisite to reach this high degree of excellence, every one, who has independence of mind enough to think for himself, must be convinced that the general practice of manufacturing cider in this state is notoriously absurd What then is the process, which our farmers generally adopt? In almost any period of autumn, apples of all tastes, sweet, tart and sour; of all sorts from the aromatic Spitzenberg to the acrid crab—of every condition, unripe, mature, mellow, sound, knotted, rotten, depending from the branch or mouldering on the ground, are all gathered together; and, as though they had not already contracted impurity enough, and a sufficiency of the "discordia semina rerum" irreconcilable principles, they are heaped into one huge mass, to ferment and rot, for a period of time, which conveniency, or perhaps chance, may prescribe. Here they are exposed to sun shine and dew, to heat and cold, to all sorts of weather. In this delicious state, the rotten and the sound are mashed under the wheel, or ground in the mill, and pressed together. The must, or juice which flows from the press, is poured into casks not always sweeten-

ed with the utmost care. Here it is suffered to undergo a fermentation regulated by no rules, until the pomace which during the fermenting process was cast up to the surface, has been suffered gradually to subside, with all the additional ascidity acquired by its exposure to the air. Now, whatever may be the right method, this must be wrong. Suffer me then to offer what reason appears to suggest on this subject; and also to express a hope, that those members of the society, who can pluck the fruit, and walk beneath the shade of their own orchards, will, at the very next season, make some experiments, in order to correct or improve the method of making cider, which I now proceed to prescribe and recommend.

In order to manufacture the first rate cider, let the apples be chosen at that period when they are perfectly ripe, but before they begin to degenerate into mellowness; and let those be refused which have fallen to the earth, which are knotty, or in the least degree rotten. Those which are thus refused may serve for bad cider, such as we now drink. They should then be laid up together in a place, where neither the sun by day may exhale, nor the dews by night alloy their delicious fragrance. In this state they will soon throw off those juices which most easily ferment, and by that mean get rid of the lighter, and perhaps more crude particles, the retention of which would probably prevent the general mass of the expressed juice from acquiring such a good body as might otherwise be expected; and assimilating it to the lighter wines, would effectually prevent it from attaining the first degree of excellence Here I would remark that the people of Devonshire, in England, prepare their apples for the press by laying them in heaps in an open part of the orchard, having found that under cover they sustained, by excessive sweating, the loss of a great proportion of their juices, and were reduced to one half their weight,though I am persuaded that the evil complained of arose from suffering them to remain too long in that confined and warm situation, and affords no argument against the practice of keeping them under roof.

A very little experience will enable us to ascertain how long they should be kept in this state. After they have thrown out the degree of moisture which may be deemed requisite, and which may probably be effected in three or four days, they should be exposed a while to the air and sun, before they are ground, in order that the fermented vapor which covers their superfices may escape, and leave the fruit perfectly dry. Now they are ready to be ground. and should be immediately put into the mill, which should, if possible, be so close set as to break the seeds of the apples. For those, it is well known, contribute to an agreeable bitter, and would communicate to the must a certain taste which could not fail to be extremely grateful to the palate. The vessels which receive the must should be so perfectly clean as to emit no kind of odor. Merely to rinse them with water is not always sufficient. It is indispensible, in order to procure the best cider, that the cask in which it is put, either to ferment or to preserve, be perfectly sweet, otherwise the very best must will turn out an indifferent liquor.—The manufacturers of wine take immense pains with their casks, and if I mistake not, be in the operation of cleaning them many months before the time of vintage.

Having now filled the casks with the new must, as it ran from the press, you approach the very crisis, the most difficult part of the process, that is, the period of fermentation. How long this should be suffered to continue, before the cask is closed tight, and the liquor secured from all internal air, good observation will be able better to ascertain from nice and repeated experiments, than any directions which I am now able to give. This, I presume, will be admitted as a sound principle, that while on the one hand, an incomplete or too short fermentation must suffer the cider to retain too much acid, and what may be called irritable matter; on the other hand excessive fermentation must leave a light and weak bodied liquor, similar to the poorest sorts of wine; and if the pomace be suffered to descend again, which it will do when the fermenting process is over, the two evils of

weakness and sourness, by uniting their bad qualities, will inevitably spoil the finest must which can be pressed from the apple. The common practice with us is, to let the fermentation take its own course, and throw off from the cider all the spirit it can; and after it has subsided, to let the crude and acid substances which adhere to the pomace, sink down with it in the very liquor, which, by its own native efforts, had meant to throw off all foul and disgusting matter. The whole process is begun and finished in the same vesssel. But, would it not be more reasonable to observe that point of time when the fermentation is beginning to cease, and before the pomace descends, to rack off in a sweet cask about four fifths of the liquor, now considerably purified, and to close it tight from the operation of all internal air? Thus, what nature meant to expel, will have escaped; and no new evil quality, derived from the acid substances which cover the surface of the fermented liquor, will be admitted or retained. A gallon or two of brandy is sometimes added to a hogshead of wine: perhaps this might improve the body, and also the taste of the cider. It is remarked by some that the juice which flows about the middle of the pressing process, makes the most excellent liqour.—It would then be prudent to refuse a certain proportion at the commencement and at the close of this operation, and preserve it for a more common drink.

In these observations I may not be perfectly correct; improvement must be expected from repeated experiments, faithfully made and accurately noted.

A further mean of improvement, which ought to be suggested, is this—to separate the different species or varieties of the apple, and learn what degrees of excellence each possess with respect to this domestic manufacture. An additional reason for this is, that they are not only of different tastes, but ripen at different periods. If kept separate, it will easily be perceived that we would have cider, as well as wines, of various names. The spirited Champaigne might be rivalled by the sparkling pearmain—the sweet Malaga, by the delicious redstreak;

sherry, perhaps even Madeira, by the aromatic Spitzenberg; and old hock yields its honors to the acidulated juice of the crab apple.

DIRECTIONS TO MAKE WINE

FROM

CHERRIES, CURRANTS, &c.

Extracted from a letter of Joseph Cooper, esq. to the editor.

"I think if my fellow citizens would consider the great expense, risk and uncertainty of being supplied with Wine from the usual source, under the present prospect of affairs in Europe, the base and dangerous practice of adulteration by many of the venders of Wine; and with what ease and trifling expense a wholesome and good Wine may be made from the fruits of our country, they would use more exertions for that purpose than heretofore. And as I have heard of many who have tried and were unsuccessful, I will give you a brief account of my method, which has never failed with me.

"I have tried currants, gooseberries, and Morrella cherries; they all make an excellent Wine, and I have no doubt that common sour pie cherry would do the same. The morella cherry, especially a smaller kind called the Salem morella, I think the most valuable I have seen, as they bear younger, fuller, more certain, and less subject to worms, than any other; their juice is of a more agreeable acid, and of an astringent quality, and for wine or brandy has the preference. I have experienced many years that the putting a cask about half full of them, and about half as many pounds of white Havanna or loaf sugar as the cask will hold gallons, then filling it by putting in the last mentioned cherries, makes a most agreeable and wholesome drink, by adding water to dilute it to any person's liking: I think in the hot summer months it is the most handy of any drink, where cool water is to be had.

"I gather the fruit when fully ripe and dry, mash it and extract the juice, if in hot weather, as soon as possible, using as little water as is necessary to get it out; then add sugar till it is palatable. I find a pound or half of sugar to a gallon sufficient, and the white Havanna the best; when the sugar is dissolved put it in a clean sweet cask for fermentation, and place it so high from the floor as to admit its dribbling some distance in racking into a tub placed to receive it, which will hold the contents of the cask. I have a thing nearly in the shape of a wooden shovel with a gutter in the handle; hang the bowl under the cask so as to prevent waste, and then let it dribble slowly; this operation should be first performed when the fermentation has nearly subsided; rack it again in about a month after, and several times more in the course of the year, as the Wine passing through the atmosphere in that slow and dribbling manner, acquires maturity in half the time requisite in the common way of management. But to return, when the cask is placed as above, fill it two or three times a day to work out the filth; when it emits a clear froth check the fermentation gradually by putting in the bung slack.

"It has long been my opinion that one of the greatest errours in making wine in our country, is the custom of making it principally of sugar and water, instead of making fruit the principal, and the spirit of fruit to make it keep through our hot summers. By the process of racking above directed, the taste of the spirit will evaporate and become imperceptible." *Trenton Paper.*

THE GRAND CANAL.

The following article concludes a pamphlet, now in circulation, in the form of a letter addressed to Simeon De Witt, esq one of the commissioners appointed by the legislature of the state of New York, to explore the ground, and make a report on the subject of the contemplated improvement of the water communication between Lake Erie and the North River.

Albany Register.

"It may be said with great truth, that the project of making a canal communication from the Great Lakes to Hudson River, is by far the most important that has heretofore been presented to any of the United States. Reflecting on the advantage that must be produced by its completion, the mind is lost in wonder. On examining the map of the United States, it will readily be seen that the whole of that immense tract of country west of the Allegany mountains, which forms a part of the states of Pennsylvania and Virginia, as well as that which comprehends the states of Kentucky and Tennessee, Ohio, the country bordering on the Illinois river, and also that which lies west of Detroit, and the whole shores of the Great Lakes, excepting the north side of Ontario, can have no communication to the Atlantic, so easy and cheap, as by means of a canal from lake Erie to Hudson river.

"The produce of this extensive tract of country passing through this state to the metropolis, will make it probably the largest commercial city in the world. Our citizens residing in that district of country which lies west of the Seneca lake, will derive immediate benefit from the canal, as they will find at their doors a ready sale for their wheat, which, at not more than twenty cents per bushel, may be brought to this city. The facility and cheapness with which their produce might be conveyed to market, would raise the lands in that district to more than twice their present value, and every other part of the country would be proportionably benefited.

"A trade in plaister of Paris and Salt would be opened, by means of the canal, to an extent that cannot be easily calculated—salt for instance, might to brought to Albany, and sold at a profit, for three shillings per bushel,* after paying a reasonable toll for the use of the canal. A considerable quantity of plaister of Paris is now sent by way of Ithica to Oswego, and from thence down the Susquehannah as far as Wilkesbarre and Nor-

* New York currency—37 1 2 cents.

thumberland, and sold at those places for fifteen dollars per ton, which is one half what it costs them to bring it from Philadelphia; and respectable persons on the Susquehannah state, that the price of land on that river, has risen in value twenty five per cent. from the introduction of plaster from the state of New-York, at so much lower rate than they were heretofore supplied from Philadelphia. The country on the North River, as well as most parts of this state and Vermont, might be supplied with plaster, by means of the canal, at a lower rate than from Nova Scotia. One moment's reflection will serve to show, that by a canal navigation, the trade in this article would be astonishingly great, and most parts of the state exceedingly benefited. Another highly important advantage, that would be afforded to our citizens in the western part of the state is, in being enabled to send butt-staves to New-York—One thousand butt staves being twelve hundred pieces, will weigh ten tons, and may be brought, paying a reasonable toll, to Albany, for sixty dollars, and for freight to New-York, handling, carting, &c. forty dollars, making a total of one hundred dollars. The price at Quebec was lately three hundred dollars; there will remain therefore a value at the head of the canal at lake Erie, of two hundred dollars. Let eighty be deducted for expenses of commissions and contingencies, the balance will be one hundred and twenty dollars for twelve hundred staves, made of white oak, which is now reduced to ashes to clear the land.

It is needless to go further into the detail on the importance of connecting the waters of lake Erie with Hudson river, as the intention of this communication, is merely to draw the public mind to reflect, on the great advantages that would result from such an improvement; and if the importance of it is rightly understood, and duly appreciated, it would most certainly be completed, without waiting to make calculations; as the immense benefits and advantages that it would produce to the state at large, cannot be calculated." [*Ed.*

COLUMBIAN AGRICULTURAL SOCIETY.

At a meeting of the Columbian Agricultural Society, held at Georgetown, according to adjournment, on Monday the 8th of June 1812, it was determined that the following premiums in plate with suitable devices, be given, under the usual regulations and restrictions, at the general meeting of the society, to be held on the third Wednesday of November next, viz:—

Premium 1.—FORTY DOLLARS, for the best bull as to form and size, age considered, not less than one year, nor more than four grasses old.

2. THIRTY DOLLARS for the best heifer as to form and size, age considered, not less than one year nor more than three grasses old.

3. THIRTY DOLLARS for the best fat bullock or spayed heifer for beef.

4. THIRTY DOLLARS for the best yoke of draft oxen broke to work single or double.

5. TWENTY DOLLARS for the best written essay on the mode of geering and working oxen, founded on experiments.

6. THIRTY DOLLARS for the best piece of fulled and dressed woolen cloth of any width, not less than seven square yards.

7. FIFTEEN DOLLARS for the 2d best piece of fulled and dressed woolen cloth as above.

8. TWENTY DOLLARS for the best piece of woolen kerseymere not less than ten yards in length.

9. TEN DOLLARS for the 2d best piece of woolen kerseymere as above.

10. TWENTY DOLLARS for the best piece of cloth, cotton warp filled with wool, to shew the wool on one side, not less than ten yards.

11. TEN DOLLARS for the 2d best piece of cloth cotton warp, filled with wool as above.

12. TWENTY DOLLARS for the best piece of fancy patterns for vests of wool and cotton not less than ten yards.

13. TWENTY DOLLARS for the best piece of flannel, all wool, not less than ten yards.

14. TEN DOLLARS for the 2d best piece of flannel as above.

15. FIFTEEN DOLLARS for the best piece of flannel, part cotton and part wool, not less than ten yards.

16. TEN DOLLARS for the best pair of woolen stockings, knit or woven, full size.

17. TWENTY DOLLARS for the best pair of fine woolen blankets, large size.

18. TEN DOLLARS for the best pair of stout coarse blankets, for laborers, full size.

19. TEN DOLLARS for the best coarse woolen cloth fulled or otherwise, calculated for laborers, combining *warmth, durability, cheapness of material and manufacture*, not less than ten yards.

☞ These are the considerations by which the quality of the blankets also will be determined.

20. THIRTY DOLLARS for the best woolen carpet, or carpeting in the piece, containing not less than thirty square yards.

By order of the standing committee.

DAVID WILEY, Sec'ry.

The following observations on fencing with *Thorn* are extracted from the "*Pennsylvania Farmer*," by which they are attributed to a "Farmer of Montgomery county, Pennsylvania. The subject is of some importance, and is recommended to the attention of Farmers in general by the practice of many well informed and experienced agriculturalists. Even in our own neighbourhood a commencement has been made of the plan of live fencing; and the superior beauty and other manifest advantages of those farms in which this beginning has been made, are proofs of the excellence of live fences above other fences, which should induce every farmer to turn his mind to the subject, at least

One thing it may be well to remark—altho' at present there may be no scarcity of timber for building, fuel and other purposes, yet in the improvement of our country, and the increase of population, the value and scarcity of wood will also encrease, so as ultimately to render *necessary* that recourse to live fencing which is now recommended, and which, as it requires time to perfect the fences, had better be commenced before it becomes no longer a matter of choice.

THORN HEDGE.

A Farmer in the County of Montgomery in Pennsylvania, on Thorn.—1803.

I have for some years past been of the mind that thorn might be applied in fence, to great advantage to farmers in this part of the country, as timber for rails is beginning to get scarce, and likely to be more so: insomuch that it appears necessary for something else to be substituted for the purpose of fencing—I am informed that considerable progress in fencing with thorn is made about Wilmington and New Castle on Delaware, where a number of farms were nearly altogether under live fence, and others rapidly progressing in that line of inclossing their fields; which must appear to every farmer to be highly advantageous—to have his plantation inclosed, as well as his fields divided, by a live fence that will last always (as it appears from accounts and observations that they are not subject to die).

It may appear to some very expensive, and to others almost impracticable; as it takes a great length of time to raise the quicks from the haws; and after planting in a hedge, to be some years before they become a sufficient fence. But if they were to take a view of the value of timber taken to repair fences annually, and the expense of performing the labour, each year for ten years, they would find the expense to be very considerable; and if there was as much expended, it would do something of consequence towards making live fence; which when made will not want any repair, except to be shear-

ed or trimmed once in three or four years, or as occasion may require.

In the latter end of November 1802, I procured about one thousand plants of thorn, from the woods and hedges, and planted them by the side of a post and rail fence, at the distance of one foot apart, in a single row. I prepared the land in order for planting in the following manner: I had a small ditch cut about nine inches wide and six inches deep; then filled the ditch about half full with fresh mould taken out of the woods or sides of fences; and in that set the quicks, at the distance aforesaid; then completely filled the ditch with the earth that had been taken out of the same. In that state they remained during the winter.

In March 1803, I collected about one thousand more, and planted in land prepared in the same manner as before; great part of which had been taken out of the ground two weeks before planting, and during that time lay in a cellar, where they got too much dried. The other part was taken out of the ground where they grew, and planted immediately; not one of which last planting, but what took kindly, and grew that summer about two or two and a half feet high; the tops being previous to planting, cut off about nine inches from the root. The other part had been taken up some time before planting, and those that were planted in the fall 1802, did not grow as well; several of them died, yet several of the most vigorous grew to the height of three feet.

After the last planting in the spring 1803, I had a piece of clover raked where wheat had grown the year before, and the stubble carried and put about six inches thick and about eighteen inches wide on each side of the rows of plants, extending to about one half the number planted: and for the other half, I collected leaves out of the woods, and laid them in the same manner, in order to prevent grass, weeds or briars from growing amongst them, as well as to keep the ground moist to encourage vegetation. I gave them a slight weeding in the sum-

mer, by pulling up the weeds and briars that grew through the stubble and leaves.

I collected, in the fall 1802, about four bushels of the haws, which I have in different preparations, in order to promote vegetation in the most speedy manner possible. As there are several ways recommended to manage the haws, in order to make them come up in the shortest time, in order to obtain that desirable information, I have some put in every preparation; and it appears, by examining the haws, that those put in cow dung and warmed by the fire seem to be the most likely to succeed.

Being some time ago in company with a very intelligent man from Brandywine Hundred, near Wilmington, and in conversation on the subject of live fence, and the best methods of growing the haws; he informed me that several in that neighbourhood had made some progress in raising quicks; but one in particular, a near neighbour of my informant, had been in the practice for about fifteen years: and on a trial of all the experiments that he thought advisable, he preferred the putting of the haws, as soon as gathered, in an open-headed cask, set out in the weather to receive all the wet, heat of the summer, and frost of the winter, for two years and an half Then in the spring, having the land well prepared, he drilled the haws in rows, in order to have them more handy to weed and keep clean. Prepared in this manner they would come up the first summer after planting, which he approved as the best method that he had tried.

Whether he had made experiment of the different methods before mentioned I know not.

I must make one observation more: which is, that a farmer in Lincolnshire planted the one side of a field with quicks on the flat surface for the sake of moisture; on the other side of the same field he threw up a double ditch, and planted the space between with quicks. The difference in the growth was very great; the former being as good at the end of three years as the latter at se-

ven. By an experiment tried in Leicester, England, the result was found to be the same.

Besides the above there are in the same work the remarks of other persons on the same subject—

(By J. B. Bordley.)

Having white thorn trees from Europe, a quantity of their haws was sown, not one whereof grew. In different years and methods, they were afterwards sown, as were sweet briar seeds, to no purpose. The late General Cadwallader likewise sowed haws of the country thorn without effect, until he was informed that young thorns were seen to be growing through cow dung dropt near a road. From this hint he penned up a number of cattle and fed them during winter with bran mixed with haws. The place was then ploughed up, and the dung of the cattle covered with earth. In the next summer the ground was there abounding in young plants of the country haw or thorn tree; but they were soon much injured by grass and weeds, for want of the ground being previously fallowed or cleaned.

Afterwards, about the first of March, 1786, I procured a quantity of the freshest cow dung to be put in a tub: warm water was poured on it, for reducing it to the consistence and warmth as if in a beast's maw. Haws were then thrown in, and all was stirred up and placed near a constant fire, for keeping it warm as blood, but no great exactness was observed. It stood thus three days, and was at times replenished with more warm water, for preserving its heat and consistence, and frequently stirred. A clean well cultivated piece of ground was then opened with a hoe, and the whole contents of the tub were drilled in the rows and covered.

On the 26th of March 1787, I first noticed that young thorn plants were grown up from those haws, in good numbers and in great vigour. Had the seeds been so prepared and drilled in the autumn of 1785, when they ripened, they probably would have given the plants in

the spring of 1786. With the like preparation, juniper, sweet briar and cedar would readily sprout and grow.—The ground ought to be well prepared, that it may be clean and mellow for receiving the seeds; which growing in rows admit of the plants being perfectly and easily hoed.

In growing haws, to have good live fence, there must not only be ditches with the hedges, but also a close attention is to be observed to weed and keep the soil clean, and the hedge defended from cattle and sheep, especially during the first three or four years; and the young plants are to be often visited, and may or not be trained to grow entwined together; but the branches are to be shortened from time to time, and in due time the whole may be plashed.

Gaps on these visits are to be looked for, and stopped before they become frequented by hogs, dogs or boys.

When the hedge is full grown, then there is a perfect live fence, without any expense of timber: and it is liable neither to rot, nor to be easily pulled down.

It is a comfort to be assured, that when designing to have thorn fences, we can readily procure any number of plants from haws. The nursery should be of good size, that the quicks may be very abundant, for selecting from them the best.

From the Portland Gazette.

CULTURE OF CUCUMBERS.

Take a barren piece of ground, fairly exposed to the sun and sufficiently moist—dig holes about as large as a bushel basket and fill them within four inches of the surface, with manure from hog sties, intermixed with lime or ashes, two parts of the former and one of the latter—plant the seeds and cover them an inch deep with earth taken from a place where the enemies of this plant have never deposited their eggs—this practice I am confident will produce a crop beyond the expectation of those who may try it. H. W.